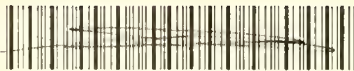


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Inspection of Commercial Fertilizers 1990

BY LESTER HANKIN

Bulletin 889

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During 1990, 109 official samples of fertilizer were collected by inspectors of the Connecticut Department of Agriculture and examined for authenticity of guaranteed analysis that is stated on the label and compliance with State Regulations. Other fertilizer samples were tested for farmers and Station research, but our findings are not included in this Bulletin. Although all guaranteed analyses are examined, only the results for the major plant nutrients of nitrogen, phosphoric acid, and potash are presented here.

Table 1 shows individual samples from 29 manufacturers. The numbers preceding the brand name are the guaranteed analyses. For example, 10-10-10, indicates the guaranteed percentage for nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O), in that order. The actual content is then shown, with deficiencies indicated by a dash (-) following the amount found. Table 2 summarizes for each manufacturer the number of guarantees examined for each plant nutrient, the percentage of samples not meeting their guarantee, and the average percentage of guarantee found. Table 3 shows the tonnage of the various grades of mixed fertilizer sold in Connecticut. Only grades prepared by at least three manufacturers are shown; other grades are placed in the miscellaneous category. The tonnage of fertilizer material and mixed fertilizer sold in Connecticut is shown in Table 4.

Two types of variability affect fertilizer analysis and must be considered in judging deficiencies. The first is the variability among different batches of the same grade from a manufacturer. This variability can be noted in Table 1 by examining the analyses of the same grade from the same manufacturer. The second type of variability is between duplicate analyses of the same sample. The variability among duplicate analyses is shown in the statement: the mean difference between duplicates for nitrogen, phosphoric acid, and potash is about two-tenths percent.

Fertilizer samples are deemed deficient in any nutrient if the analysis is below the guarantee by more than the values established by the Association of American Feed Control Officials. Overall, 109 guarantees for nitrogen were tested and 1.8% were deficient; 106 guarantees for phosphoric acid were tested and 7.5% were deficient; and 107 guarantees for potash were tested and 4.7% were deficient. In 1989 the percentages of deficiencies for nitrogen were 1.8%, for phosphoric acid 10.1%, and for potash 18.6%. Thus the percentage of deficiencies for nitrogen remained the same and decreased for phosphoric acid and potash.

Analyses were performed by Craig Musante, Mamie Pyles, and David Stilwell. Samples were collected by John Chapman, Raymond Weller, Melanie Attwater, and Alton VanDyke. Mr. VanDyke is the Fertilizer Control Official for the Department of Agriculture. Fertilizer laws are administered by the Commissioner of Agriculture.

Lester Hankin
Chief, Analytical Chemistry

Table 1. Analysis of individual samples of commercial fertilizers.

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
A.H. HOFFMAN, INC.						
4	2	2	Hoffman Super Manure	4.3	4.0	3.0
5	10	5	Hoffman Vegetable Food	5.1	10.3	4.9
7	7	7	Hoffman Flower Food	7.1	8.4	8.7
AGWAY, INC.						
5	10	10	Agway BlendRite	6.6	12.3	9.5
5	10	10	Agway Blend Rite	5.4	9.4	9.5
7	5	5	Agway Nature's Way Organic Lawn Food	6.3-	5.5	5.3
12	24	24	Agway Lawn Starter Fertilizer	12.1	24.0	24.5
15	15	15	Agway 15-15-15	15.4	14.7	14.4
16	4	8	Agway Greenlawn Fall/Winter Fertilizer	16.2	3.9	7.8
22	6	8	Agway Greenlawn Fertilizer	22.3	6.8	7.8
22	6	8	Agway Greenlawn Fertilizer	24.6	6.6	9.3
27	5	12	Agway Grassroots	28.9	6.6	14.8
30	6	12	Agway Grassroots	30.3	8.5	10.4-
ALASKA FISH FERTILIZER CO.						
5	2	2	Alaska Fish Fertilizer	5.1	2.6	1.8
BURPEE GARDEN PRODUCTS CO.						
17	23	6	Burpee Vegetable Fertilizer Granules	18.1	22.8	7.4
18	11	12	Burpee Fruit, Nut, Citrus	18.9	11.7	11.6
18	11	12	Burpee Rose Fertilizer	20.4	9.9-	11.6
18	11	12	Burpee Shrub & Tree, Groundcover Fertilizer	18.2	11.1	11.6
CADWELL & JONES, INC.						
5	10	5	C & J Specialty Fertilizer	5.5	9.5	4.9
7	7	7	C & J High Protein Plant Food	7.1	9.6	7.7
10	6	4	C & J Specialty Fertilizer	10.1	7.0	4.6
10	10	10	C & J Specialty Fertilizer	11.0	10.4	10.9
10	20	20	C & J Specialty Fertilizer	10.2	19.9	20.3
15	15	15	C & J Specialty Fertilizer	15.2	16.5	15.5
18	11	17	C & J Specialty Fertilizer	18.7	11.9	15.8-
20	10	10	C & J Super Surge Lawn Food	20.6	10.6	10.7
25	5	5	C & J Specialty Fertilizer	25.5	6.0	5.6
28	3	10	C & J Specialty Fertilizer	29.5	4.6	10.0
28	7	14	C & J Turf Product	29.1	8.3	14.3
CHEMLAWN SERVICES CORPORATION						
16	2	6	Agriturf	16.1	2.8	7.2
CHEVRON CHEMICAL CO.						
3	10	3	Ortho Up-Start Vit B-1 Plant Starter	3.1	13.7	3.9
5	10	5	Ortho House Plant Food	5.2	10.0	5.2
8	10	8	Ortho Vegetable Food	8.3	10.8	8.9
10	8	7	Ortho Fern & Ivy Food	10.9	7.9	7.5
10	12	6	Ortho Tomato Food	11.8	10.1-	8.0
12	6	6	Ortho-Gro Liquid Plant Food	12.8	6.2	6.3
CROP PRODUCTION SERVICES, INC.						
5	10	10	CPS	5.6	7.8-	11.2
5	10	10	CPS	6.3	8.9-	9.5
5	10	5	CPS Village Green	5.0	9.4	3.7-
6	6	6	Crop Production Services Mulnite Mix	7.1	6.0	13.2

Table 1. Analysis of individual samples of commercial fertilizers.

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
10	6	12	CPS	10.3	8.0	13.7
10	6	4	CPS Village Green	11.4	5.7	4.9
10	8	10	CPS	10.4	14.3	9.7
10	10	10	CPS	10.1	9.8	11.0
10	10	10	CPS Village Green	10.2	9.3	9.8
10	20	20	CPS	10.2	20.5	19.2
15	8	12	CPS	15.1	12.6	7.2-
15	15	15	CPS	15.0	12.5-	15.6
19	19	19	CPS	19.0	18.1-	18.1
19	19	19	CPS	19.2	16.1-	17.3
21	0	32	CPS	19.0-		31.5
46	0	0	CPS Urea Fertilizer	46.3		
ESPOMA CO.						
4	3	2	Espoma Plant Tone All Purpose Plant Food	4.4	5.4	3.2
4	6	6	Espoma Garden Tone for Tomatoes, Veg., Shrubs	4.2	10.3	10.6
4	6	4	Espoma Holly Tone	6.6	7.6	6.0
ESTECH						
16	16	16	Par Ex	16.5	15.8	19.8
HY-TROUS/FLASH SALES, INC.						
			Mer-Made Liquid Seaweed	0.1	0.2	1.6
4	12	4	Hy-Trous African Violet Liquid Fert.	4.0	11.7	4.7
5	10	5	Hy-Trous Liquid Plant Food	4.8	10.0	5.2
HYPONEX CORPORATION						
8	4	2	Hyponex Plant Food Stix Organic Formula	10.6	6.8	3.3
10	5	5	Hyponex Bug Dart Plus	10.6	6.7	6.4
INTERNATIONAL SPIKE, INC.						
8	24	8	Jobe's Fert. Spikes for Growing Prize Tomatoes	10.8	27.3	7.5
8	24	8	Jobe's Fert. Spikes for Tomatoes	8.4	27.6	9.1
10	10	4	Jobe's Pl. Fd Spikes for Flowering Plants	11.7	12.5	5.6
10	15	15	Jobe's Fert. Spikes for Fruit Trees	13.6	13.3-	17.2
16	2	6	Jobe's Pl. Fd. Spikes for Lush Ferns and Palms	16.7	3.5	7.9
16	8	8	Jobe's Fertilizer Spikes for Trees	17.1	8.6	10.4
LEBANON CHEMICAL CORP.						
10	18	10	Green Gold Re-Nu Lawn Food	12.3	18.3	10.9
LUSTER LEAF PRODUCTS, INC.						
			Luster Leaf Micronized Iron	0.2		
44			Luster Leaf Rapifeed Nitrogen	45.5		
MILWAUKEE METROPOLITAN SEWERAGE DISTRICT						
6	2		Milorganite	6.6	3.1	
6	2	0	Milorganite	7.2	3.7	
NITROCHEM, INC.						
34	0	0	Ammonium Nitrate (Bulls Eye)	35.2		
O.M. SCOTT & SONS CO.						
12	10	12	Scott's All Purpose Builder Garden Fert.	12.3	11.1	12.8
15	2	3	Scott's Summerizer	17.0	2.1	4.3
16	9	12	Scott's Shrub, Tree, Grndcvr Builder w/micros	18.2	10.3	14.8

Table 1. Analysis of individual samples of commercial fertilizers.

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
17	23	6	Scott's Starter Fertilizer	17.7	27.8	8.4
27	3	3	Scott's Turf Builder Plus 2	27.2	2.8	4.3
28	6	4	Scott's Lawn Pro Step 3	32.1	7.0	6.1
29	3	4	Scott's Turf Builder	29.3	3.0	4.3
32	3	10	Scott's Lawn Pro Step 4	33.7	3.1	10.2
32	4	3	Scott's Lawn Pro Step 2	32.6	4.1	4.5
OFF SHORE VENTURES, INC.						
3	4	3	Squanto's Secret Fish Fertilizer	3.2	4.1	3.4
PETERS FERTILIZER PRODUCTS						
10	30	20	Peters Professional Blossom Booster	10.1	29.9	20.4
12	36	14	Peters Professional African Violet	13.5	35.7	14.7
15	30	15	Peters Professional Houseplant Food	15.6	30.9	15.2
17	6	6	Peters Professional Acid Greening	17.2	6.0	6.2
20	20	20	Peters Professional All Purpose	21.2	19.4	19.7
30	10	10	Peters Professional Orchid	30.0	10.1	10.6
PLANT RESEARCH LABORATORIES, INC.						
1	3	2	Roger's Garden Oxygen Plus African Violet Food	1.2	3.7	2.1
RA-PID-GRO CORP.						
23	19	17	Ra-Pid-Gro House Plant Food	23.7	20.5	17.0
23	19	17	Ra-Pid-Gro House Plant Food	24.0	18.3	17.2
23	19	17	Ra-Pid-Gro Plant Food	23.9	19.7	16.8
ROSS DANIELS, INC.						
6	12	6	Ross Pl. Fd. Spikes for Beautiful Flowering Pl.	7.4	12.8	7.9
8	16	16	Ross Gro Stakes for Ornamental Trees & Shrubs	8.1	18.8	17.3
10	10	10	Ross Gro Stakes For Evergreens	10.3	11.3	11.5
14	5	5	Ross Plant Food Spikes For Beautiful Foliage	15.7	6.4	6.0
16	10	9	Ross Gro-Stakes For Trees & Shrubs	18.3	9.8	9.5
SCHULTZ COMPANY						
10	15	10	Schultz Instant Liquid Plant Food	10.3	15.1	10.4
SIERRA CHEMICAL CO.						
14	14	14	Osmocote Vegetable & Bedding Plant Food	15.5	14.4	15.0
17	6	10	Osmocote Pl. Fd. for Potting Mixes plus Minors	18.1	6.9	12.5
17	6	10	Osmocote Time Release Plant Food	17.1	6.9	12.6
18	6	12	Osmocote Outdoor & Indoor Plant Food	18.3	7.8	13.3
STERN'S MIRACLE-GRO PRODUCTS, INC.						
15	30	15	Stern's Miracle Gro Plant Food	17.0	30.3	15.0
30	10	10	Stern's Miracid Soil Acidifier and Plant Food	31.0	10.8	11.7
UNIVERSAL CHEMICAL CO., INC.						
5	10	3	Electra Plant Food	5.1	12.0	3.7
VERMONT ORGANIC FERTILIZER						
5	3	4	Vermont 100 Premium Fertilizer	5.2	6.3	5.2
WEATHERLY CONSUMER PRODUCTS, INC.						
13	4	5	Jobe's Pl. Fd. Spikes for Beautiful House Plants	13.0	5.8	8.4
13	4	5	Jobe's Pl. Fd. Spikes for House Plants	13.3	5.9	7.8

Table 2. Summary for each manufacturer of number of claims for individual plant nutrients, percentage of claims not meeting guarantee, and average percentage of guarantee for each nutrient.

Company	Number samples	Number of claims			% Not meeting claim			Average % of claim		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
A. H. Hoffman	3	3	3	3	0	0	0	104	141	124
Agway	10	10	10	10	10	0	10	106	112	102
Alaska Fish Fert.	1	1	1	1	0	0	0	102	130	90
Burpee Garden Prod.	4	4	4	4	0	25	0	107	99	103
Cadwell & Jones	11	11	11	11	0	0	9	104	115	105
Chemlawn Services	1	1	1	1	0	0	0	101	140	120
Chevron Chemical	6	6	6	6	0	17	0	108	105	115
Crop Production Serv.	16	16	14	15	7	36	20	105	106	106
Espoma	3	3	3	3	0	0	0	127	159	162
Estech	1	1	1	1	0	0	0	103	99	124
Hy-Trous/Flash Sales	3	2	2	2	0	0	0	98	99	111
Hyponex	2	2	2	2	0	0	0	119	152	147
International Spike	6	6	6	6	0	17	0	117	121	121
Lebanon Chemical	1	1	1	1	0	0	0	123	102	109
Luster Leaf Products	2	1	0	0	0	-	-	103	-	-
Milwaukee	2	2	2	0	0	0	-	115	170	-
Nitrochem	1	1	0	0	0	-	-	104	-	-
O. M. Scott & Sons	9	9	9	9	0	0	0	107	103	113
Off Shore Ventures	1	1	1	1	0	0	0	104	100	113
Peters Fert. Products	6	6	6	6	0	0	0	104	100	103
Plant Research Labs.	1	1	1	1	0	0	0	120	123	105
Ra-Pid-Gro	3	3	3	3	0	0	0	104	103	100
Ross Daniels	5	5	5	5	0	0	0	111	113	116
Schultz	1	1	1	1	0	0	0	103	101	104
Sierra Chemical	4	4	4	4	0	0	0	105	116	117
Stern's Miracle-Gro	2	2	2	2	0	0	0	108	105	109
Universal Chemical	1	1	1	1	0	0	0	102	120	123
Vermont Organic	1	1	1	1	0	0	0	104	210	130
Weatherly Consumer Prod.	2	2	2	2	0	0	0	101	146	162
Totals	109	107	106	107						

Table 3. Distribution of mixed fertilizers sold in Connecticut July 1, 1989-June 30, 1990

Grade	Tons	Grade	Tons
00-10-40	82.4	18-05-09	111.7
00-15-30	44.0	19-03-06	4.5
00-25-25	1.5	19-04-04	230.4
04-05-04	15.7	19-04-06	90.3
05-01-01	3.3	19-19-19	356.8
05-09-04	0.3	20-03-03	129.9
05-10-05	876.9	20-03-05	10.3
05-10-10	533.0	20-04-10	47.0
05-15-05	5.2	20-05-10	280.1
06-24-24	3.3	20-08-08	45.9
07-05-05	16.7	20-10-10	23.0
08-04-04	38.5	20-20-20	57.9
08-12-04	26.6	21-05-07	250.0
08-16-16	72.3	22-03-03	87.3
09-05-03	27.8	22-03-06	7.4
09-17-09	143.5	23-04-08	8.1
10-05-05	25.7	22-06-08	223.9
10-06-04	734.0	22-22-05	23.5
10-07-07	10.3	23-04-04	25.3
10-10-10	2020.5	23-12-18	70.5
10-16-20	510.7	23-19-17	0.6
10-18-10	167.7	25-03-03	336.7
10-20-10	264.9	25-03-05	164.7
10-20-12	145.5	25-03-09	18.5
10-20-20	296.3	25-04-08	31.0
10-23-10	13.8	25-05-10	211.2
11-10-10	1.9	25-05-15	118.0
11-23-10	34.8	25-10-10	8.8
11-25-11	46.9	26-03-03	45.2
12-04-08	72.7	26-04-06	194.6
12-06-06	0.2	27-03-03	434.0
12-09-09	0.7	28-05-11	26.7
12-10-10	6.3	28-06-12	7.5
12-12-12	4.7	29-03-05	19.7
12-30-12	13.0	29-04-08	113.9
13-13-13	66.5	30-00-20	243.0
13-25-12	115.8	30-03-03	88.1
14-14-14	210.3	30-03-10	207.7
14-22-06	32.9	30-04-04	974.7
15-00-00	13.2	30-06-12	39.5
15-08-12	361.6	30-10-10	17.7
15-10-10	174.0	32-03-03	43.5
15-15-15	559.3	32-04-04	140.6
15-30-15	137.0	32-04-08	17.9
16-02-06	3412.0	32-05-07	57.1
16-04-08	159.3		
16-05-10	21.0	TOTAL	16944.9
16-08-08	17.5	MISCELLANEOUS	13518.7
16-32-16	2.6	GRAND TOTAL	30463.6

Table 4. Tonnage of fertilizer material and mixed fertilizers sold in Conn. July 1, 1989-June 30, 1990

Commodity	Tons		
CHEMICAL NITROGEN		NATURAL ORGANICS	
Ammonium nitrate	120.3	Blood, dried	4.0
Ammonium sulfate	40.3	Cottonseed meal	1.0
Calcium nitrate	158.3	Manure	2590.6
Nitrogen solution- <28%	7.4	Sewage sludge, activated	285.0
Nitrogen solution-28%	2605.7	TOTAL	2880.6
Sodium nitrate	3.3	Commodity	Tons
Urea	1295.9	SECONDARY AND MICRONUTRIENTS	
Urea, sulfur coated	12.6	Aluminum sulfate	1.0
Urea formaldehyde	0.03	Borax (boron as borax)	29.8
Nitrogen-not identified	12.7	Ferrous sulfate	0.03
TOTAL	4256.53	Iron chelate	0.78
PHOSPHATES		Magnesia (mag oxide)	0.26
Diammonium phosphate	12.5	Manganese sulfate	1.8
Monoammonium phosphate	24.1	Sulfur	24.7
Bone meal, steamed	15.6	Zinc sulfate	0.75
Bone, precipitated	3.1	Sec/micronutrients	422.1
Lime phosphate	121.0	TOTAL	481.22
Phosphate rock	0.6	LIME PRODUCTS	
Phosphoric acid	8.8	Liming materials	8.2
Superphosphate, normal	20.0	TOTAL	8.2
Superphosphate, conc.	20.3	UNIDENTIFIED PRODUCTS	
Phosphates, not ident	10.3	Single nutrients	570.4
TOTAL	236.3	Specialty products	12.2
POTASH		TOTAL	582.6
Muriate of potash-60%	178.3	TOTAL COMMODITIES	8727.55
Sulfate of potash-magnes	40.1	TOTAL COMMERCIAL FERT	30463.59
Potassium nitrate	22.0	GRAND TOTAL	39191.05
Potassium-sodium nitrate	0.8		
Potassium sulfate	40.0		
Potash, not identified	0.9		
TOTAL	282.1		



The Connecticut Agricultural Experiment Station,

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